CHRONOLOGICAL FILE - 1984

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To/Location: E. L. Cambridge

## Enzyme Immobilization Supports

A report titled "Applications of Inorganic Materials as Supports for Immobilized Enzymes or Cells" was issued. Samples of Corning controlled pore glass in the untreated, $ZrO_2$ treated and organo-silane treated form have been obtained for our evaluation when resources allow.

## Sol Gel

A sample of Conoco "Catapal" alumina has been received for use in studies evaluating PCACH as a substitute when resources allow.

## Aluminum Nitride

The objective and key issues for the project have been formulated and a "paper chemistry" and literature search will be carried out as time allows during the summer.

## Alumina Properties

A presentation on alumina properties (MGA) and their impact on smelter operations was given at Columbia Falls (by DMB). The material presented is being added to and expanded on in a report on the same topic which is now being written. The objectives of the project which includes development of a matrix of information of the relationship between MGA properties and smelter operations were reviewed with Columbia Falls personnel and modified to take their views into account. Input on content of the report was solicited and received. A draft of the report will be circulated in early July for further comment. The draft information matrix will be put together in August.

## Magnesium for Magnesite

Acid process - last month it was reported that magnesium extraction was >95% from calcined magnesite but there was little or no selectivity with respect to calcium, iron, or aluminum impurities using 10% solids and 10% excess HCl in the leach. Operating at 0% excess acid improved selectivity with respect to Fe and Al but not Ca. Operating at 21% solids

had a significant impact only upon Al impurity. Acid leach alone will not give adequate Mg-Ca separation. Work is in progress on obtaining relevant solubility data in chloride solutions and on evaluating the effect of sulfate additions to the leach liquor to precipitate $CaSO_4$. These or other process options may improve Mg-Ca separation.

Acid leaching of uncalcined magnesite at reflux has been proved feasible but frothing caused by $CO_2$ evolution is excessive. Whether there is an economic advantage to this method will be determined in evaluations planned for later in the project.

Carbonation Process

Work began this month on the second flowsheet proposed for Mg recovery from magnesite. Magnesite was calcined, rehydrated, and extracted with carbon dioxide solution. The selectivity of magnesium extraction versus that of impurities was very good. One trial sample of $MgCO_3.3H_2O$ recovered for the carbonate extraction liquor had better purity than commercial MgO on an equivalent basis.

Thus far extraction efficiency for Mg has been below 50%. Experiments are being carried out to identify the cause of the fall-off in Mg extraction rate. There are several possible explanations and the low recovery in the first experiment is not a "show stopper" by any means.

USBM Equipment

In response to questions from Jerry Davis concerning incorporation of tanks or other items into the AD-123 plant, I talked with Don Keosterke in Washington, DC. In response to some hypothetical cases he said the following:

1. Equipment incorporated into a permanent set-up here would probably be depreciated on an accelerated schedule in the event of termination of the loan agreement. The same would be true for equipment worn out by use.

2. They may attempt to declare the equipment surplus in advance of the September renewal date so that renewal will not be necessary. In that case we would effectively take over ownership (unless another agency wanted it which is very unlikely according to D.K.).

Safety

The technicians have reviewed safety in Room 8-9 which is used for the magnesium, calcination, and crystallization work. Signs for labeling hazards are on order and other concerns are being addressed and present no major difficulty. Crowding is the only source of concern that cannot be resolved at the Technical Manager level or below.

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